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New Carventine species from Borneo (Heteroptera: Aradidae)

by

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With 19 figures

ABSTRACT

Description of one new genus and three new species of the Aradid subfamily Carventinae (*Sandakaptera hauseri* n. gen. et sp., *Froeschnerissa mahunkai* n. sp. and *Drakeida lobata* n. sp.) is given. Larval morphology of the *Sandakaptera* and *Drakeida* species is also discussed.

INTRODUCTION

Through the kindness of Dr. B. Hauser I have the opportunity to study an Aradid material collected by him in NE Borneo (Sabah). The material treated here is, for further reasons, valuable. It contains the first larvae of a closely related group of apterous genera as well as of the genus *Drakeida,* and a species in the genus *Froeschnerissa* and *Drakeida* is for the first time described on the basis of both sexes, respectively.

All the drawings were made of dry specimens, with drawing apparatus. Larvae of *Drakeida lobata* were cleared in diluted KOH and investigated in transmission light too. Abbreviations of measurements are as follows: tlb = total length of body, lh = length of head, wh = width of head, la = length of antenna, lpn = length of pronotum, wpn = width of pronotum, lsc = length of scutellum, wsc = width of scutellum, mwb = maximum width of body, lt = length of thorax + first two tergites, lcdp = length of central dorsal plate, wcdp = width of central dorsal plate. One paratype of each apterous species and three of Drakeida lobata is deposited in the Hungarian Natural History Museum, Budapest, all other material is deposited in the Geneva Natural History Museum.

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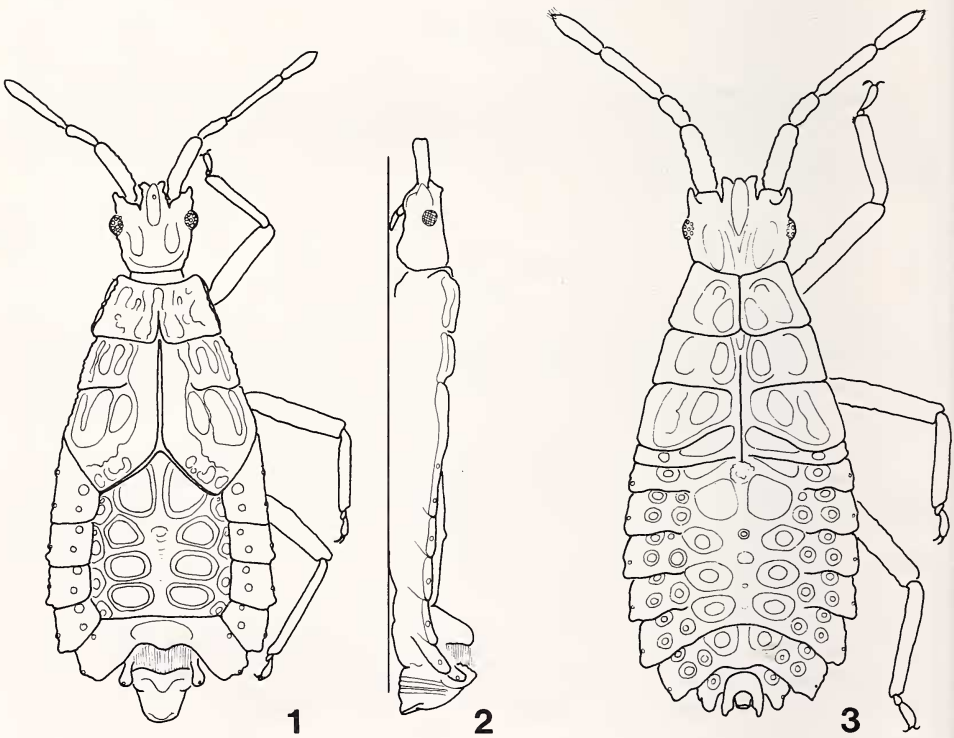
Sandakaptera n. gen. (Figs 1-7)

Apterous, closely related to *Zoroaptera* and *Froeschnerissa*. Body flattened, brown, covered by thin, on some body parts and in furrows thick incrustation. Dorsal surface elevated at tip of abdomen only. Head slightly longer than wide, moderately widening anteriorly. Rostrum arising from a not too narrow, slit-like atrium, short, length of the free part about 1/3 of total length of head. Pro- meso- and metanotum and first two abdominal tergites fused, medially continuous. Posterior border of pronotum on lateral parts distinct. Meso- and metanotum and first two tergites lateromedially fused into a smooth, shiny flattened plate. Lateral parts of meso- and metanotum distinct. Abdomen with pentangular tergal plate consisting of terga 3-6. Apodemal impressions large, depressed, smooth, only marginally finely punctured. Posterolateral edge of laterotergites with narrow, triangular tubercles increasingly developed on segments 3-7, laterotergites 2 and 3 fused. All spiracles lateral. Pro- meso- and metasternum + first two visible sternites completely fused.

Type species: *Sandakaptera hauseri* n. sp.

Sandakaptera is closely allied to *Froeschnerissa* and *Zoroaptera*. The median part of the thorax bears a single longitudinal carina in the first genus, two subparallel carinae



FIGS 1-3.

Sandakaptera hauseri n. gen. et sp., 1: male, dorsal view; 2: same, lateral view; 3: elder larva.

(with a furrow between them) in the second and a narrow furrow in the third. *Sandakaptera* is unique in having a continuous midlateral, smooth ridge from mesonotum to tergite 2, in the position of spiracles all being lateral and in the more flattened body.

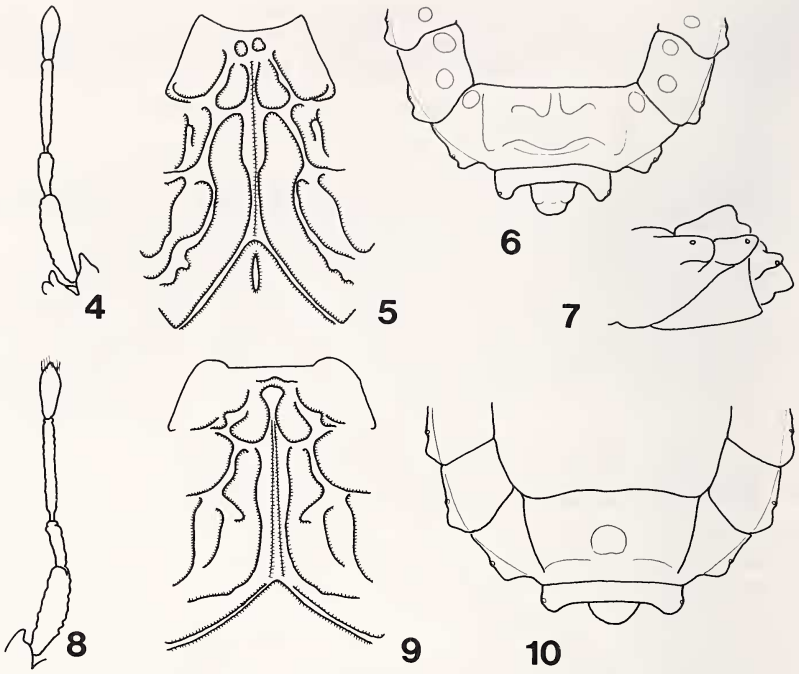
Sandakaptera hauseri n. sp. (Figs 1-7)

A d u l t s : Head moderately long and widening anteriorly. Eyes small. Genae slightly surpassing clypeus, divaricating. Anterior process of head reaching about 1/4 of antennal joint 1. Antenna long, slender, relative length of antennal joints 1 to 4 as 32: 15: 33: 20 (the left antenna of the holotype male is teratological, joints 3 and 4 are fused). Joints 1-3 with tubercles bearing short, curled hairs. Rostrum short, reaching about 2/3 of head, not reaching hind margin of shallow, wide rostral groove. Thorax widening posteriorly, lateral border of promeso- and metanotum straight, with insinuation between them. Pronotum with widely sinuate anterior border, anterolateral edge acute-angled, reaching anterior border of neck. Surface medially with longitudinal depression on posterior 2/3, two small tubercles with a fine groove between them on anterior 1/3, laterally with 4 (2+2) elevated tubercles, the mediolateral ones smooth. Meso- and metanotum consisting of the depressed median part, the smooth mediolateral part and the rugose lateral part. Median part bearing a longitudinal carina reaching from middle of pronotum to central dorsal plate. Continuous mediolateral ridges irregularly sculptured on the area of tergites 1 and 2. Legs long, femur and tibia with tubercles bearing short, curled hairs. Pulvillus present, long, curled, tip near to tip of claws (observed with light microscope only). Pro- meso- and metasternum with lateral tooth posterolaterally. Central dorsal plate with median longitudinal furrow anteriorly. Median ridge slightly elevated, position of larval scent gland openings recognizable. Apodemal impressions large, slightly depressed, smooth, double pattern of midlateral apodemal impressions not recognizable. Laterotergites with clearly delimited apodemal impressions and with increasingly large, triangular tubercle on segments 3-7. All spiracles lateral, clearly visible from above, situated anteriorly to triangular tubercles. Tip of abdomen of the different sexes see on figs 1-2, 6-7. On ventral side 2: 2: 1 pattern of apodemal impressions clear. Hind margin of each sternites elevated, that of segment 6 deeply sinuate medially.

L a r v a : The description is made on the basis of an elder larva, probably fifth instar (fig. 3). Head much wider than on the adult. Genae and antenniferous tubercles developed. Antenna four-jointed, relative length of antennal joints 1 to 4 as 27: 16: 32: 25. Pro- meso- metanotum and only first abdominal tergite continuous medially along the fine suture of the ecdysal line, hind border of tergite 1 delimited by depression. Apodemal impressions recognizable also on the thorax, the lateral, rugose part of the adult corresponding to the lateral and/or midlateral impressions, the mediolateral, smooth ridge of the adult to the median impressions. There is a "transition zone" on tergites 1 and 2 each with 4 (2+2) apodemal impressions. Dorsolaterotergites not delimited on tergites thus central dorsal plate recognizable on the basis of the pattern of apodemal impressions and of the median lack of border between tergites 3-6. Lateral parts (i.e. laterotergites) of tergites 1 and 2 clearly separated.

Measurements (in mm). Male: tlb 3.21, lh 0.53, wh 0.53, la 1.31, lt 0.98, lcdp 0.98, wcdp 0.84, mwb 1.34. Female: tlb 3.66, lh 0.59, wh 0.57, la 1.38, lt 0.95, lcdp 1.43, wcdp 0.96, mwb 1.64. Elder larva: tlb 2.46, lh 0.45, wh 0.52, la 1.12, lt 0.70.

Holotype (male) and paratypes (1 female, 1 elder larva, 1 younger larva): Borneo, Sabah, Sandakan, 23.IV.1982, Sab-82/7, leg. B. Hauser. The material was collected in the Kabili-Sepilok Forest Reserve, by sifting litter and decaying wood and using the Winkler apparatus.



FIGS 4-10.

4-7: *Sandakaptera hauseri* n. gen. et sp., 8-10: *Froeschnerissa mahunkai* n. sp.; 4, 8: antenna; 5, 9: pattern of fused thoracal and abdominal tergites; 6, 10: tip of abdomen of female, dorsal view; 9: same, lateral view.

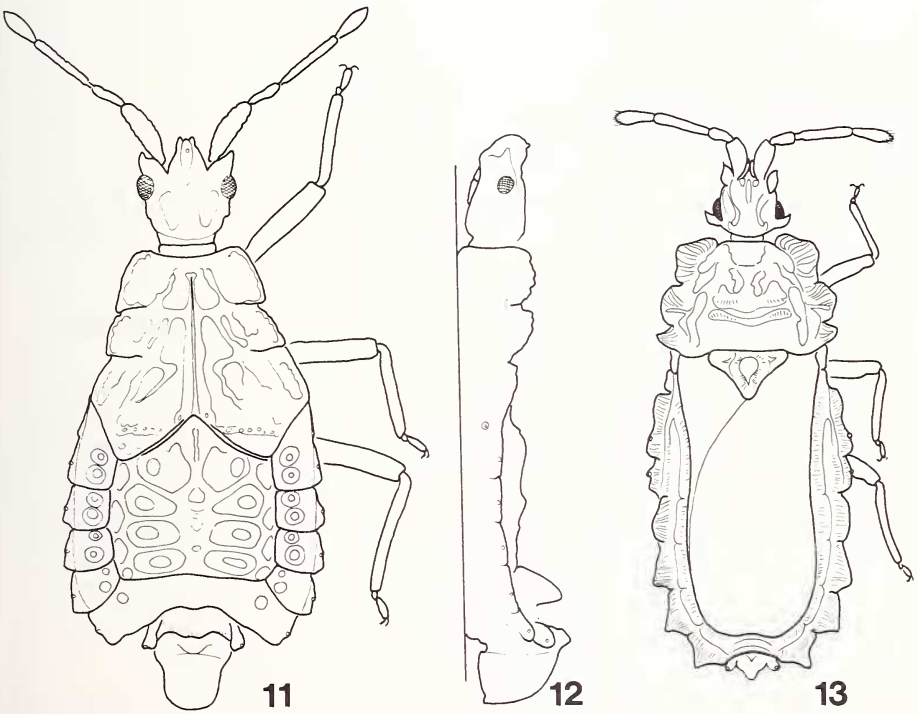
The new species is, gratefully, dedicated to Dr. Bernd Hauser (Geneva Natural History Museum).

Froeschnerissa mahunkai n. sp. (Figs 8-12)

Head longer than wide. Antenniferous tubercles pointed. Antennae slender, joints 1-3 with tubercles bearing short, curled hairs. Relative length of antennal joints 1 to 4 as 32: 16: 32: 20. Genae slightly surpassing tip of clypeus, anterior process of head surpassing ⅓ of antennal joint 1. Eyes small, lateral border of head with distinct, narrow postocular tubercle. Rostrum short, surpassing hind border of wide, shallow rostral groove. Pro- meso- and metanotum and abdominal tergites 1-2 medially fused into two longitudinal carinae with a furrow between them. Pronotum with continuous neck region, lateral lobe surpassing neck anteriorly. Mediolateral parts of thoracal tergites elevated, smooth, hind borders distinct, depressed, but meso- and metanotum submedially continuous. Lateral parts elevated, with carinae and tubercles. Hind border of metanotum marked by a row of punctures (male) or by almost continuous depression (female). Abdomen with central dorsal plate strongly elevated anteriorly, plate on female distinctly longer than on male.

Apodemal impressions large, depressed, punctuate, centres positioned somewhat lateral, smooth. Median portion of median apodemal impression of tergite 3 extensively punctuate, elevated, anteriorly with short, longitudinal furrow. Laterotergites 2 and 3 fused. Lateral borders with flat, triangular tubercles increasingly protruding posteriorly. Lateral border of tergite 7 sinuate behind tubercle (on male tip of triangular tubercle surpassing hind border posteriorly). Tip of abdomen of both sexes see on figs 10-12. Spiracle 2 ventral on flat tubercle, not far from lateral border (on female visible from above), distinctly larger than the others, spiracles 3-8 lateral, anteriorly to tip of triangular tubercles. Pretarsus with slender, curled, lobe-like pulvillus.

The new species differs from the only species of the genus (*heveli* Kormilev, 1986) in e.g. genae surpassing clypeus, in the shape of pronotum, and in the strikingly differing shape of tip of abdomen.



FIGS 11-13.

11-12: *Froeschnerissa mahunkai* n. sp.; 13: *Drakeida lobata* n. sp.; 11-13: male, dorsal view; 12: same, lateral view.

Measurements (in mm). Male: tlb 3.43, lh 0.66, wh 0.61, la 1.38, lt 0.96, lcdp 0.98, wcdp 0.93, mwb 1.61. Female: tlb 3.61, lh 0.70, wh 0.64, la 1.43, lt 0.96, lcdp 1.30, wcdp 1.11, mwb 1.79.

Holotype (male) and paratype (female): Borneo, Sabah, Keningan, 1380 m, 12.V.1982. Sab-82/43c, leg. B. Hauser.

The new species is, with pleasure, dedicated to Dr. Sándor Mahunka (Hungarian Natural History Museum, Budapest), collector of many soil-inhabiting heteropterans.

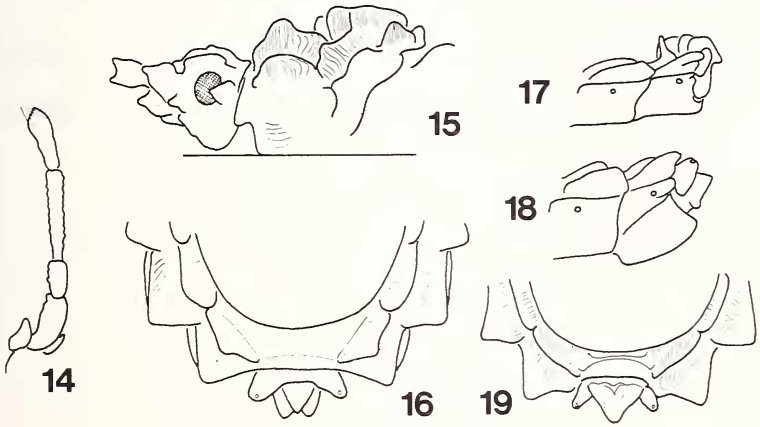
Drakeida lobata n. sp. (Figs 13-19)

A d u l t s : Elongate, brown, with yellow, striate lobes of long, erect or curled hairs attached to each other by incrustation, the lobes determining the contours of the body. Head somewhat shorter than wide. Anterior process reaching about ½ of antennal joint 1, genae surpassing tip of clypeus, lobes of genae much surpassing tip of clypeus. Antennae long, relative length of antennal joints 1 to 4 as 22: 16: 38: 24. Vertex with vertical lobes in two rows on each side. Antenniferous tubercles and postocular tubercles with lobes, latter much surpassing eyes laterally. Pronotum with straight anterior margin. Lateral margins with 3 askew lobes, straight hind margin with one small lobe laterally. Disc with vertical lobes and low "tubercles" of incrustation, posterior, sloping part smooth, shiny. Scutellum triangular, lateral border of lateral lobes sinuate, tip rounded. Wings transversally wrinkled. Abdomen dorsally with 4 (2+2) rows of lobes (fused anteriorly), the inner row subvertical, the outer row askew anteriorly, horizontal posteriorly. Tip of abdomen of both sexes see on figs 16-19. Spiracles 2 and 3 situated on tip of long, narrow tubercles, virtually spiracles lateral on lobes of corresponding ventrolaterotergites, 4-7 ventral near the margin of the lobes, 8 apical. Ventral side with extended incrustations.

L a r v a e : In the material examined there are L_2, L_3 and L_4 (or L_5) larvae, allowing and necessitating description of some of their morphological characters. L_2 larvae have eyes with 2 ommatidia, fused clypeus and labrum, and apparently 4 jointed antenna. Relative length of antennal joints 1 to 4 about as 20: 20: 20: 40. Rostrum is 3 jointed. Femur and trochanter are distinct on each leg. Bacilliform setae (MAHUNKA & ZOMBORI 1985) are extremely rare, most of chetae are hairs, and those on lateral border of body are flagelliform, extremely long, longer than diameter of hind femur, their apex very fine, irregularly curled. Dorsal abdominal scent gland openings present as transversal slit surrounded by rugose cuticule on segments 3 and 4 only, distinct, large on hind border of tergite 3, distinct, smaller on hind border of tergite 4. Third opening represented by stronger sclerotization on hind border of tergite 5. Pretarsus with lobe-like pulvillus. L_3 larvae have 3 jointed antenna, last joint tapering in the middle. Relative length of antennal joints 1 to 3 as 23: 16: 61. Genae distinctly surpassing clypeus as conical tubercles. Antenna and body already with several bacilliform or clavate setae, those on lateral margin of body shorter than on L_2, blunt, lanceolate or clavate. Third scent gland opening represented by rounded sclerotization, the first two about equally developed. Each abdominal segment with a large tubercle laterally, segment 9 developed into a furca, much surpassing 10. Lateral apodemal impressions indistinct on both sides. Trochanter and femur fused on each leg. Wing pads absent. L_4 (or L_5?) larvae have 3 jointed antenna, last joint tapering in the middle (marking future border of joints 3 and 4). Relative length of antennal joints 1 to 3 as 32: 18: 60. Rostrum 3 jointed. Wing pads developed, metathoracic one somewhat longer than mesothoracic one, fundament of scutellum absent. Body and extremities with setiform, bacilliform and clavate (lanceolate) setae. Ventral opaque areas sculptured somewhat similarly to those of *Aradus krueperi*

(VÁSÁRHELYI 1982, fig. 25) but the teeth or scales are mostly two- or three-pointed. Third scent gland opening small, rounded, open.

The new species is longer than either *incrustata* Kormilev, 1958, or *setifera* Vásárhelyi, 1979, and is unique in the genus with antennal joint 3 being much longer than joint 4 (subequal in the other two).



FIGS 14-19.

Drakeida lobata n. sp.; 14: antenna; 15: head and pronotum, lateral view; 16, 18: tip of abdomen of female; 17, 19: tip of abdomen of male; 16, 19: dorsal view; 17, 18: lateral view.

Measurements (in mm). Male: tlb 3.89, lh 0.50, wh 0.57, la 1.18, lpn 0.86, wpn 1.32, lsc 0.38, wsc 0.64, mwb 1.50. Female: tlb 4.30, lh 0.59, wh 0.61, la 1.27, lpn 0.89, wpn 1.45, lsc 0.46, wsc 0.68, mwb 1.64.

Holotype (male) and paratypes (1 male, 3 females and 6 larvae): Borneo, Sabah, Sandakan, 2.V.1982. Sab-82/35, leg. B. Hauser. The material was collected in the Mile 4 Forest.

REFERENCES

KORMILEV, N. A. 1958. Notes on Aradidae from the Eastern Hemisphere, XV. (Hemiptera). *J. N. Y. ent. Soc.* 66: 87-97.

— 1986. Two new genera and seven new species of Aradidae (Heteroptera). *J. N. Y. ent. Soc.* 94 (2): 249-261.

MAHUNKA, S. and L. ZOMBORI. 1985. The variability of some morphological features in Oribatid mites. *Folia ent. hung.* 46 (1): 115-128.

VÁSÁRHELYI, T. 1979. Three new Carventine species from New Guinea (Heteroptera, Aradidae). *Annls hist.-nat. Mus. natn. hung.* 71: 101-105.

— 1982. On the larval development of *Aradus krueperi* Reuter (Heteroptera: Aradidae). *Folia ent. hung.* 43 (1): 229-233.